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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/276,803 03/26/99 LEE

B SEC. 506

MMC1/0411  
JONES VOLENTINE STEINBERG & WHITT  
12200 SUNRISE VALLEY DRIVE  
SUITE 150  
RESTON VA 20191

EXAMINER

BEREZNY, N

ART UNIT

PAPER NUMBER

2823

DATE MAILED:

04/11/01

**Please find below and/or attached an Office communication concerning this application r proceeding.**

**Commissioner of Patents and Trademarks**

# Office Action Summary

Application No.

09/276,803

Applicant(s)

LEE ET AL.

Examiner

Neal Berezny

Art Unit

2823

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 08 May 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☒ Claim(s) 6 is/are objected to.
- 8) ☐ Claims \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

## Attachment(s)

- 15) ☒ Notice of References Cited (PTO-892)
- 16) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5 and 6.
- 18) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Claim Objections*

1. Claim 6 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 6 fails to further limit the parent claim because it contains the limitations of performing the anneals either separately or in-situ, which exhausts all possible means of performing the anneals, which is inherent in the parent claim.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

3. Claims 1-5, 8 and 11 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Al-Shareef et al. (6,162,744). Al-Shareef teaches forming a storage electrode, a high dielectric layer, a plate electrode, a first anneal at a first temp. at 600-800°C, see claim 28, a second anneal at a second temp. less than the first temp. and at 100-600°C, see claim 2, the high dielectric consisting of STO, BST, and PZT dielectrics,

col.4, ln.5-6, the electrodes consisting of RuO<sub>2</sub> conductors, col.3, ln.55-60, forming an interdielectric over the capacitor, col.5, ln.29-30, and where the first and second anneals are performed after the formation of the high dielectric, col.4, ln.63-64.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 6, 7, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Al-Shareef et al. (6,162,744). Al-Shareef, claim 9, teaches at least one of the two anneals to be conducted in a plasma environment, and under various environments, col.4, ln.17-39, but appears to be silent in specifying the specific equipment to be used to achieve these conditions. Official notice is given that given the teachings of Al-Shareef, it would be obvious to achieve the taught anneal conditions in well-known equipment commonly used for such applications, such as a furnace or in a vacuum RTP, and as suggested and anticipated by Al-Shareef they can be performed either separately or in-situ. One of ordinary skill in the art would be motivated to use commonly available equipment to achieve the taught anneals in order to keep process costs low.

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6. Al-Shareef also teaches at least two multiple temperatures in multiple annealing steps, suggesting and anticipating more than two anneals. Al-Shareef appears not to specifically require that the third temp. be less than the second temp. It would be obvious to one of ordinary skill in the art to perform a third anneal at a lower temperature in order to reduce oxygen vacancy and densify the film, col.4, ln.55-57. Further, it has been held that a mere duplication of a process step, or the division of a single step into multiple steps, involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8. In addition, neither the claims nor the specifications disclose the critical nature nor unexpected results arising from a third anneal.

7. Claims 9-10, 12-13, and 15-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Al-Shareef et al. (6,162,744) as applied to claims 1-8, 11, and 14 above, and further in view of Azuma et al. (WO 96/02067 PCT) and Wolf, Vol.1, p.57. Al-Shareef anticipates performing one or both anneals after the formation of the second electrode, col.5, ln.6-10, but fails to elaborate on the various specific combinations between anneals and various layers. Azuma teaches performing the second anneal after the formation of the plate electrode, fig.4, el.P47, P48, and P50. Wolf teaches performing an anneal after the formation of the interdielectric, p.57, table 4, section 3. It would be obvious to one of ordinary skill in the art to combine the teachings of Azuma and Wolf to the anticipated processes of Al-Shareef, to further elaborate on the anticipated processes of performing the second anneal after either the formation of the plate electrode or after the formation of the interdielectric. Official notice is also given

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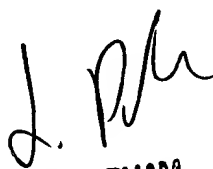
that in light of Al-Shareef, Azuma, and Wolf, it would be obvious to one of ordinary skill in the art to anticipate the process of performing one or both of the anneals after either the formation of the plate electrode or the interdielectric. One would be so motivated in order to avoid risk of oxidation of either of the electrodes from any out-diffusion of oxygen from the high dielectric layer, thereby reducing the capacitance of the capacitor. In addition, neither the claims nor the specifications disclose the critical nature nor unexpected results arising from performing one or both anneals after the formation of either the plate electrode or the interdielectric.


### CONCLUSION

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Neal Berezny whose telephone number is (703) 305-1481. The examiner can normally be reached on Monday to Friday from 9:00 to 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy, can be reached at (703) 308-4918. The fax phone number for the organization where this application or proceeding is assigned is (703) 308-7724.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

  
LONG PHAM  
PRIMARY EXAMINER

 4/7/01

Neal Berezny

Patent Examiner

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